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Thesis

THE RELATIONSHIP BETWEEN VOCABULARY
AND SCHOLARSHIP IN GRADE EIGHT

Submitted by
Lillian M. Hunt
(B.S., Simmons College, 1931)

In partial fulfillment of requirements for
the degree of Master of Education

1948

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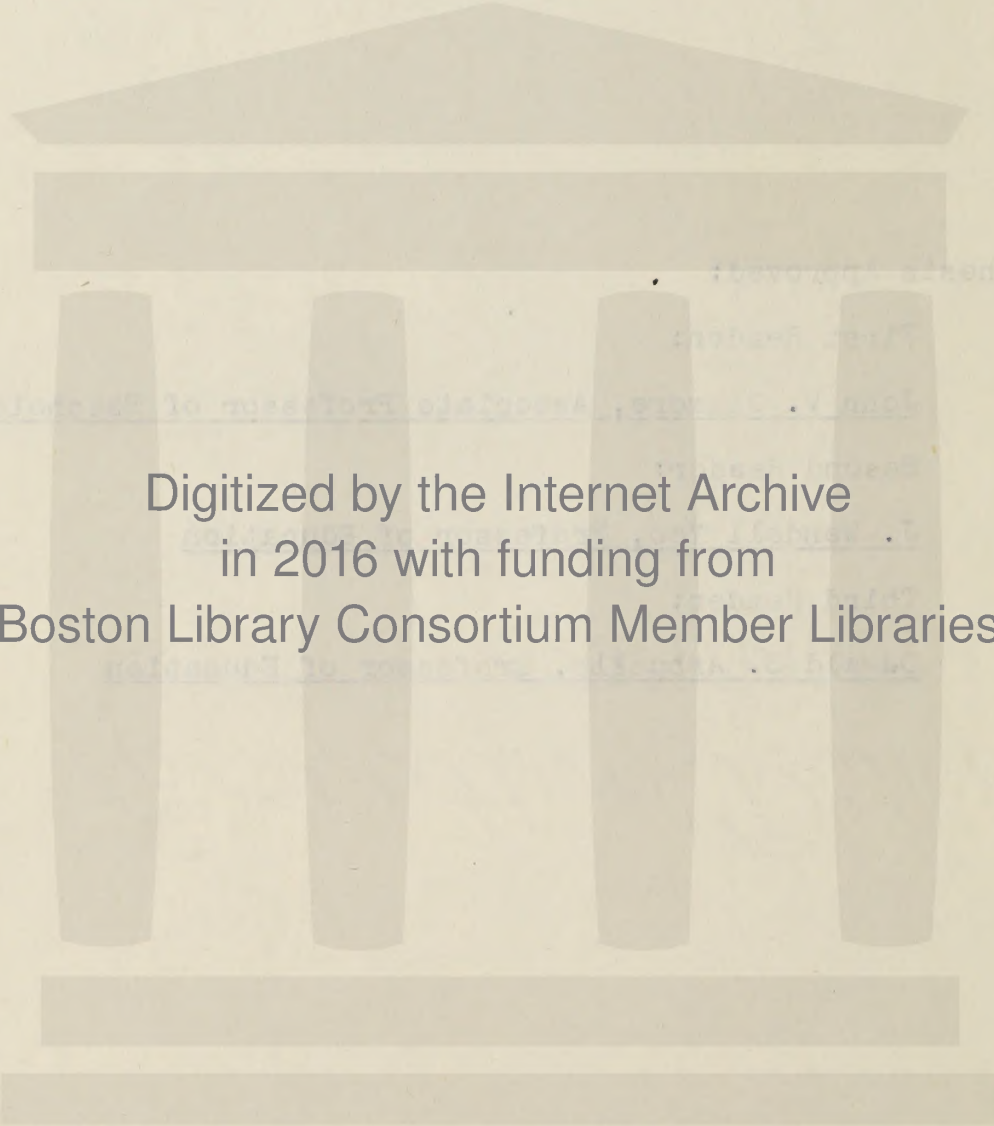
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CHAPTER I

THE PROBLEM

The advantage of possessing an excellent and exact vocabulary is quite indisputable. By well-chosen words people communicate to each other their ideas and the products of their learning in a way that allows for precise comprehension; only with an adequate word knowledge is thinking clarified; with a wide understanding of words many pleasures are enjoyed more completely; through mutual appreciation of carefully selected words, the message of radio is colorful to its fullest measure.

The extent of a vocabulary has been used as a significant measure of adult success. In a study which was conducted at the Human Engineering Laboratory, Johnson O'Connor¹ found that

large vocabularies characterize executives and possibly outstanding men and women in other fields because words are the instruments by means of which men and women grasp the thoughts of others and with which they do their own thinking. They are the tools of thought.

Similarly, the success of a child in school has

1. Johnson O'Connor. English Vocabulary Builder, Human Engineering Laboratory, Hoboken, 1939, part II

vocabulary as a significant concomitant. Only in so far as he understands single words can his knowledge gradually increase. For the greater part of his studying he must demonstrate that he knows and how much he knows through the use of the particular words at his personal command. Proof of his knowledge is determined largely by his response to questions. Unless the words in the question are clearly his words, unless he can accurately interpret them, he may not be able to demonstrate that he has the real grasp of the concepts which his mental ability has actually allowed.

THE PURPOSE OF THE PROBLEM

Many teachers are of the opinion that a majority of children are greatly handicapped in school-subject achievement by lack of adequate general, as well as specific vocabularies and that attention should be focused upon this lack.

It is the purpose of this thesis to carry on a study in order to determine how important a place vocabulary holds in relation to several others factors which contribute to successful work in grade-eight major subjects, and to determine whether the place of vocabulary is important enough to show the need and emphasize the advisability of incorporating in the

curriculum definite and meaningful vocabulary training.

STATEMENT OF THE PROBLEM

This study proposes to determine the relationship between a general vocabulary and scholarship in English, mathematics, and social studies for grade eight. The following questions will be considered:

1. What is the relationship between school grades in English and scores on tests of vocabulary, reading, verbal mental ability, and non-verbal ability?
2. What is the relationship between school grades in mathematics and scores on tests of vocabulary, reading, verbal mental ability, and non-verbal ability?
3. What is the relationship between school grades in social studies and scores on tests of vocabulary, reading, verbal mental ability, and non-verbal ability?
4. What is the relationship between vocabulary scores and scores on tests of reading, verbal mental ability, and non-verbal ability?

BACKGROUND OF THE PROBLEM

Of the many vocabulary studies found in the literature, some are, to a degree, pertinent to the problem of this thesis. One that applies quite closely has considered the importance of a particular vocabulary to success in a particular subject. Buckingham,¹ working with first year algebra students, found their vocabulary scores and algebra scores to be significantly related.

Somewhat less pertinent are some interesting studies which show a striking importance of vocabulary in predicting school success. Hart² used vocabulary tests with two classes of high school seniors and found he could predict success or failure of more than seventy-five per cent. Templeton³ found by using an amazingly short list of twenty-nine words that he could predict the college success of the 2430 college freshman with whom he worked. His conclusion would doubtless be considered likewise somewhat amazing.---
If a student sets out to make higher grades than his

1. G. E. Buckingham. Mathematics Teacher, (February, 1937), 30, 76-79

2. Mark Hart. "Vocabulary--A Prediction of Success," Phi Delta Kappa, (December, 1942), 25, 92-93

3. W. D. Templeton. "Vocabulary and Success in College," School and Society, (February, 1940), 51, 221-224

classmates, he should build up a vocabulary greater than any of his classmates. Bernard¹ broke away from the traditional assumption that a psychological rating is the best criterion of future success by proving with a group of 168 college students that vocabulary scores correlated higher with success than did the psychological ratings.

a vocabulary-building study by Johnson² is also relevant. After careful training in a mathematical vocabulary, Johnson noticed significant growth in the ability to solve problems using that vocabulary.

In summary, the vocabulary studies referred to above seem to indicate that:

1. The size of a person's vocabulary may be used as a measure of his adult vocational success.
2. A trained vocabulary in a particular subject is significantly related to grades in that subject.

 1. H. W. Bernard. "Some Relationships of Vocabulary to Scholarship," School and Society, (April, 1940), 51, 494-496

2. Harry C. Johnson. "The Effect of Instruction in Mathematical Vocabulary upon Problem Solving in Arithmetic," Journal of Educational Research, (October, 1944), 38, 202

3. That vocabulary skill may be used in predicting school success.
4. That vocabulary scores correlate higher with school success than do psychological ratings.

CHAPTER II

PROCEDURE

POPULATION

This study was carried on in the Eastern Junior High School at Lynn, Massachusetts. Lynn is an industrial city of 101,000 population. The city district from which Eastern Junior High School's 1220 pupils come is largely residential; a few bakeries, laundries, and machine shops are scattered throughout the area. The economic status of the families represented covers a full range, from high to low, as follows: less than 1% in the high income bracket, 17% in the low income bracket, the remaining 82% distributed in the middle income bracket. In 32 of the 199 homes a foreign language is spoken: 11 French, 11 Italian, 3 Greek, 2 Chinese, 2 Polish. 28'

The population of the study consists of six intact classes of grade eight, a total of 214 pupils. Seven of these were dropped, either because they were transferred to other schools, or because they were not pupils of the Eastern Junior High School in grade seven. The actual number of pupils for the study became 207: 108 boys and 99 girls.

Classes at the Eastern Junior High School are arranged homogeniously. Grade six Kuhlmann-Anderson intelligence quotients and teacher grades are used to determine the placement of each child in a given class. For purposes of this study an attempt was made to obtain a distribution of grade eight pupils as near average as possible. Six classes were chosen from a possible ten, using, in addition to teachers' opinions of each class, the same criteria of Kuhlmann-Anderson intelligence quotients and teacher grades as a basis of choice. The resultant distribution of mental ability scores determined by the Army General Classification Test show, Figure 1, this group to be close to

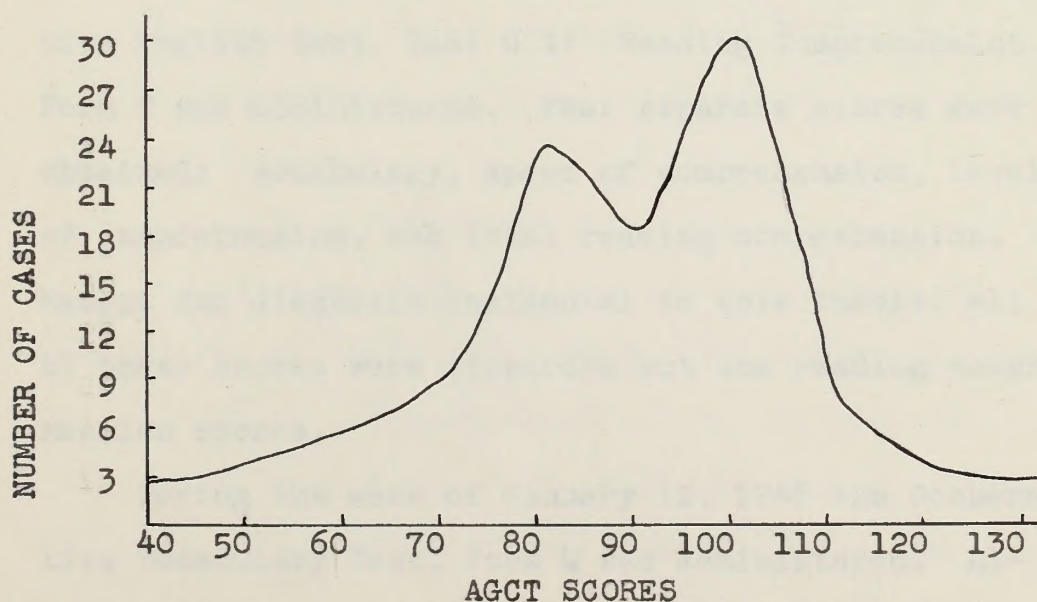


Figure I. Distribution of Mental Ability Scores of 207 Eighth Grade Children by the Army General Classification Test, Civilian Edition

the usual for grade eight, although the bi-modal curve shows fewer scores than might be expected between 80 and 100.

PROGRAM OF TESTING

Four tests were administered: vocabulary, reading, verbal ability, and non-verbal ability. Each of the six classes was separately tested in four different testing periods, spaced from January 6, 1948 to February 12, 1948. All tests were personally administered, with the exception of one vocabulary test and one reading test for one class. These were administered for that group by its own English teacher.

During the week of January 6, 1948 the Cooperative English test, Test C 1: Reading Comprehension, Form T was administered. Four separate scores were obtained: vocabulary, speed of comprehension, level of comprehension, and total reading comprehension. Except for diagnosis incidental to this thesis, all of these scores were discarded but the reading comprehension scores.

During the week of January 12, 1948 the Cooperative Vocabulary Test, Form Q was administered. Although the Cooperative Reading Test, above mentioned, contains a vocabulary test and allows for a vocabulary

score separate from the reading score, it seemed advisable to give a separate and longer test of vocabulary since the emphasis of this thesis is on vocabulary.

During the week of January 19, 1948 the SRA Non-Verbal Classification Form, Form AM was administered. A non-verbal ability test is included in this study because non-verbal ability is an important and measurable ability that is a factor in school success, as well as for the reason that such a measure might bring out information about the student who has ability but is unable to demonstrate it in successful school grades because of a vocabulary or reading difficulty.

During the week of February 2, 1948 the Army General Classification Test, First Civilian Edition¹ was administered.

SCHOOL RECORDS USED

Six teacher-given grades were taken from the pupils' record cards for each of the three major subjects: English, mathematics, and social studies. Four grades were taken from grade seven records and two grades from grade eight records. Grade seven

1. The Army General Classification Test, First Civilian Edition will hereafter be referred to as "AGCT."

marks were considered with those of grade eight in order to minimize, to a degree, any undue subjectivity of one teacher's marking as against another's. Each of these six marks for each major subject was converted into grade points by giving the teacher grade of "H" the number value of 90, the teacher grade of "C" the number value of 80, the teacher grade of "P" the number value of 70, and the teacher grade of "U" the number value of 50, as shown in Table I. From

TABLE I
CONVERSION OF TEACHER GRADES TO GRADE POINTS

Teacher Grade	Description of Grade	Grade Points
H	Honor Work	90
C	Creditable Work	80
P	Passing Work	70
U	Unsatisfactory Work	50

the total of grade points earned by each pupil in each subject, an average, single value for each major subject was found.

STATISTICAL PROCEDURE

In order to determine the relationships existing between the factors measured by this study, product-moment coefficients of correlation were calculated

for the following:

Major Subjects and Cooperative Vocabulary

Major Subjects and Cooperative Reading

Major Subjects and AGCT

Major Subjects and SRA Non-Verbal

Vocabulary and Cooperative Reading

Vocabulary and AGCT

Vocabulary and SRA Non-Verbal

Reading and AGCT

Reading and SRA Non-Verbal

AGCT and SRA Non-Verbal

A scattergram¹ and a correlation table² was set up for each correlation, deviations were taken from assumed means of the two distributions and a coefficient of correlation was calculated by the product-moment formula.³

The standard error of each product-moment correlation was calculated in order to determine their

1. Henry E. Garrett. Statistics in Psychology and Education, Second Edition, Longmans, Green and Company, New York, 1937, p. 259

2. Ibid. p. 267

3. Ibid. p. 270

$$r = \frac{\sum x'y' - CxCy}{\sigma x \sigma y}$$

reliability.¹

Critical ratios were then calculated² to show the significance of the relationships between each two factors correlated in this study.

In order to discover how much influence vocabulary seems to have upon success in each of the major subjects compared with the other factors measured by this thesis: reading, verbal ability, and non-verbal ability, partial correlations were found for:

Major Subjects and Vocabulary

Major Subjects and Reading

Major Subjects and AGCT

Major Subjects and SRA Non-Verbal

holding all others constant. The effect of this partialling out of factors from a given correlation, according to Garrett,³

1. Charles C. Peters and Walter R. VanVoorhis. Statistical Procedures and Their Mathematical Bases, McGraw Hill Company, Inc., New York, 1940, p. 152

$$6r = \frac{1 - r^2}{\sqrt{N}}$$

2. J. P. Guilford. Psychometric Methods, McGraw Hill Company, Inc., New York, 1936, p. 60-61

$$CR = \frac{r}{6r}$$

3. H. E. Garrett. op. cit. p. 411

is to eliminate the differences among the individuals which are introduced by the variable thus controlled. In general a coefficient of partial correlation may be said to represent in a convenient way the net relationship between two variables when the influence of one or more factors which might increase or decrease the relationship sought has been ruled out or held constant.

In order to interpret the partial correlation formulas in terms of this study, numbers were assigned to the grade points for each subject and to each of the test scores as follows: English--1, Cooperative Vocabulary--2, Cooperative Reading--3, AGCT--4, SRA Non-Verbal--5, Mathematics--6, Social Studies--7.

Twenty-seven partial correlations of the first order were calculated by variations of the partial correlation formula for three variables.¹

Twenty-one partial correlations of the second order were calculated by variations of the partial correlation formula for four variables.²

1. Charles W. Odell. Statistical Method in Education, D. Appleton-Century Company, Inc., New York, 1935, p. 264-265

$$r_{12.3} = \frac{r_{12} - r_{12}r_{23}}{\sqrt{1 - r_{12}^2} \sqrt{1 - r_{23}^2}}$$

2. Ibid. p. 265-266

$$r_{12.34} = \frac{r_{12.3} - r_{14.3}r_{24.3}}{\sqrt{1 - r_{14.3}^2} \sqrt{1 - r_{24.3}^2}}$$

Twelve partial correlations of the third order were calculated by variations of the partial correlation formula for five variables.¹

- 1. C. W. Odell. op. cit. p. 268

$$r_{12.345} = \frac{r_{12.34} - r_{15.34}r_{25.34}}{\sqrt{1 - r_{15.34}^2} \sqrt{1 - r_{25.34}^2}}$$

CHAPTER III

PRESENTATION AND INTERPRETATION OF DATA

The collected data are arranged in twelve tables for more ready reference and interpretation.

MAJOR SUBJECTS WITH COOPERATIVE VOCABULARY

The relationships between success in grade eight with the major subjects: English, mathematics, and social studies, and vocabulary are found by the data, Table II, to be much less significant than was expected

TABLE II

COEFFICIENTS OF CORRELATION FOR
MAJOR SUBJECTS WITH COOPERATIVE VOCABULARY

Major Subject	<u>Cooperative Vocabulary</u>		
	r	6r	CR
English	.27	.06	4.50
Mathematics	.26	.06	4.33
Social Studies	.39	.06	6.60

in the premise of this thesis. The coefficients of correlation for major subjects with vocabulary denote present but slight correlation. These low correlations doubtless result from the poor vocabularies possessed by a majority of these pupils. They have a working knowledge of but a limited number of common

words. Some of this is due to the failure of many junior high teachers to allow any time definitely directed at meaningful, vocabulary study. These limited vocabularies result, also, from the type of reading done by most of these pupils. The books used in the English classes, for example, are antiquated in form and content, completely lacking in appeal. Identical books are given to each class regardless of its mental-ability level. For many, to "read" means to stumble over meaningless words. Provision should be made to put the most appealing type of reading in the hands of all of these children in order to show them enjoyment in reading at their particular level. Instead, they fight against assigned reading which means their vocabularies remain at the limited level of comic-book language and run-of-the-mill "thrillers."

The speller used by these children is inadequate for word study except for the better classes. The words are so difficult for whole classes that frequently, after a week's study, when spelling-test day arrives, a child, as spokesman for the group, will point out a word and ask, "What is that word?" Only negligible vocabulary skill is gained from such a list.

The correlation of vocabulary with mathematics might have been more significant if the test had been of a different type; that is, if it had contained a specifically mathematical vocabulary rather than a general vocabulary.

There is very little relationship between social studies and vocabulary. Names from histories and geographies are tossed on assignment papers and maps with very little conception of their pronunciation or derivation.

MAJOR SUBJECTS AND COOPERATIVE READING

The relationships between success in grade eight with the major subjects: English, mathematics, and social studies, and Cooperative reading are the most significant of the four factors considered, as shown by Table III. Although mathematics and Cooperative

TABLE III

COEFFICIENTS OF CORRELATION FOR
MAJOR SUBJECTS WITH COOPERATIVE READING

Major Subject	<u>Cooperative Reading</u>		
	r	6r	CR
English	.49	.05	9.80
Mathematics	.38	.06	6.33
Social Studies	.55	.05	11.00

Reading show only slight relationship, English and Cooperative Reading and social studies and Cooperative Reading show substantial correlation.

The difference in the significance of these three correlations may be explained, in part, by the difference in the methods used at the Eastern Junior High School in the teaching of these three subjects. Social studies, which shows the most marked correlation with Cooperative Reading, requires the greatest amount of reading. This quantitative reading puts greater importance upon comprehension and speed than upon vocabulary. Lessons are prepared from several different text books, in addition to constant use of current-event magazines written for junior high pupils, and newspapers.

The subject called "English" includes spelling, grammar, composition, and literature, with disproportionate emphasis upon spelling and grammar. Too little time is provided for reading, coupled with the book difficulty already mentioned.

Mathematics seldom requires any reading. Class work and home work consist almost entirely of drill with number problems. Word problems are rarely used with the high mental-ability classes, and never with

the "lower" classes.

MAJOR SUBJECTS WITH AGCT

The relationship between success in grade eight with major subjects: English, mathematics, and social studies, and AGCT, Table IV, closely parallels

TABLE IV
COEFFICIENTS OF CORRELATION FOR
MAJOR SUBJECTS WITH AGCT

Major Subject	AGCT		
	r	6r	CR
English	.28	.06	4.66
Mathematics	.29	.06	4.83
Social Studies	.33	.06	5.50

the correlations with major subjects and Cooperative Vocabulary. This would be expected since tests of vocabulary and of mental ability correlate closely. For this particular group of pupils vocabulary and mental ability, as shown by AGCT scores, seem to be of about the same importance to scholarship in each subject. Mental ability is more significantly related to social studies than to English or mathematics, possibly because of the common reading factor in AGCT and social studies.

MAJOR SUBJECTS WITH SRA NON-VERBAL ABILITY

The relationships between SRA non-verbal ability and success in grade eight with the major subjects: English, mathematics, and social studies, Table V,

TABLE V

COEFFICIENTS OF CORRELATION FOR
MAJOR SUBJECTS WITH SRA NON-VERBAL

Major Subject	SRA Non-Verbal		
	r	6r	CR
English	.25	.07	3.57
Mathematics	.24	.07	3.42
Social Studies	.23	.07	3.28

have the least significance of any of the factors measured by this study. Since mathematics deals with the application of relationships comparable to those evidenced by non-verbal ability, it might be expected that mathematics would be more significantly related to non-verbal ability than the correlation indicates. This apparent lack of ability to recognize and apply mathematical relationships is manifest, according to teachers' opinions, in all Eastern Junior High School subjects utilizing mathematics.

The low correlations of non-verbal ability with

English and social studies are what might be expected since English and social studies are verbal studies.

COOPERATIVE VOCABULARY WITH COOPERATIVE READING,
AGCT, AND SRA NON-VERBAL

Vocabulary is shown to have its most significant place in this study in its relationship to Cooperative Reading and AGCT, Table VI. This may be due to

TABLE VI

COEFFICIENTS OF CORRELATION FOR
COOPERATIVE VOCABULARY WITH
COOPERATIVE READING, AGCT,
AND SRA NON-VERBAL

Name of Test	Cooperative Vocabulary		
	r	6r	CR
Cooperative Reading	.61	.04	15.25
AGCT	.62	.04	15.50
SRA Non-Verbal	.27	.06	4.50

the fact that Cooperative Reading and AGCT have similar construction in that they both contain a measure of vocabulary.

The low SRA Non-Verbal correlation is to be expected since the non-verbal test contains no vocabulary.

COOPERATIVE READING WITH COOPERATIVE VOCABULARY,
AGCT, AND SRA NON-VERBAL

It is of interest to note from Table VII that Cooperative Vocabulary correlates with Cooperative

TABLE VII

COEFFICIENTS OF CORRELATION FOR
COOPERATIVE READING WITH
COOPERATIVE VOCABULARY,
AGCT, SRA NON-VERBAL

Name of Test	Cooperative Reading		
	r	6 r	CR
Cooperative Vocabulary	.61	.04	15.20
AGCT	.57	.05	11.40
SRA Non-Verbal	.42	.06	7.00

Reading more significantly than does AGCT, indicating that vocabulary skill is more important to ability in reading than is general mental ability.

It is not to be expected that SRA Non-Verbal would have decidedly marked correlation with Cooperative Reading since reading is a verbal ability. This correlation could indicate that skill in reading does include the non-verbal ability of recognizing relationships.

AGCT WITH COOPERATIVE VOCABULARY, COOPERATIVE READING, AND SRA NON-VERBAL

The correlations of AGCT with Cooperative Vocabulary and Cooperative Reading, Table VIII, indicate that both vocabulary and reading ability have a marked

TABLE VIII

COEFFICIENTS OF CORRELATION FOR
AGCT WITH COOPERATIVE VOCABULARY,
COOPERATIVE READING, AND
SRA NON-VERBAL

Name of Test	AGCT		
	r	6r	CR
Cooperative Vocabulary	.62	.04	15.00
Cooperative Reading	.57	.05	11.40
SRA Non-Verbal	.33	.06	5.50

relationship to mental ability, with vocabulary considerably more related to mental ability than is reading ability, as previously mentioned.

Non-verbal ability, as shown by SRA Non-Verbal scores, has only a slight relationship to AGCT which is somewhat surprising since the arithmetic and block-counting sections of AGCT would indicate the need of non-verbal ability.

PARTIAL CORRELATIONS

In this study, as is usually found,¹ the coefficients of partial correlation are smaller than the product-moment coefficients. Tables IX, X, XI, and XII show the partial correlations, in most cases, to be so small that they have negligible significance. However, they serve to show the relative importance of vocabulary to scholarship success as compared with the importance to scholarship of all the other factors measured.

MAJOR SUBJECTS AND COOPERATIVE VOCABULARY

Partial correlations of major subjects with Cooperative Vocabulary when Cooperative Reading, AGCT, and SRA Non-Verbal are held constant, Table IX, show

TABLE IX

PARTIAL CORRELATIONS FOR MAJOR SUBJECTS WITH
COOPERATIVE VOCABULARY WHEN COOPERATIVE
READING, AGCT, AND SRA NON-VERBAL
ARE HELD CONSTANT

Major Subject	Partial Correlation
English	.05
Mathematics	.01
Social Studies	.08

1. C. W. Odell. op. cit. p. 265

that vocabulary is slightly more significant to social-study success than to English or mathematics. This is true also in the product-moment correlations, Table II, and may be explained by the same reasons: that of teaching methods. None of these partial correlations is large enough to evidence any important relationship to major-subject success.

MAJOR SUBJECTS AND COOPERATIVE READING

As with the product-moment correlations of Table III, partial correlations of major subjects with Cooperative Reading when Cooperative Vocabulary, AGCT, and SRA Non-Verbal are held constant, Table X, indi-

TABLE X

PARTIAL CORRELATIONS FOR MAJOR SUBJECTS WITH
COOPERATIVE READING WHEN COOPERATIVE
VOCABULARY, AGCT, AND SRA NON-VERBAL
ARE HELD CONSTANT

Major Subject	Partial Correlation
English	.38
Mathematics	.14
Social Studies	.41

cate that of the four factors measured, reading is, by far, the most important factor in success with all

three major subjects, an observation which speaks eloquently for the need of emphasis upon reading, especially in view of a crying need for improved reading ability noted by all teachers of this group. Both the partial correlations with English and social studies show substantial relationships with Cooperative Reading, as is true of the earlier correlations.

The expected low correlation between mathematics and Cooperative Reading shows to a more marked degree in the partial correlations with the influence of the other measured factors ruled out than was evident in the product-moment correlations of Table III. As was previously explained, this low correlation doubtless results from the very limited use of reading ability in the teaching of mathematics.

MAJOR SUBJECTS WITH AGCT

Partial correlations of major subjects with AGCT when Cooperative Vocabulary, Cooperative Reading, and SRA Non-Verbal are held constant, Table XI, are too small to indicate any important relationship to major subject success. However, of the three, the partial correlation of AGCT with mathematics has the greatest significance. This greater relative importance of AGCT to mathematics than to the other major subjects,

TABLE XI

PARTIAL CORRELATIONS FOR MAJOR SUBJECTS WITH
AGCT WHEN COOPERATIVE VOCABULARY,
COOPERATIVE READING, AND SRA NON-
VERBAL ARE HELD CONSTANT

Major Subject	Partial Correlation
English	.02
Mathematics	.08
Social Studies	.01

shown by the partial correlations and not evidenced by the product-moment correlations, Table IV, might be expected from the nature of the AGCT test with its mathematics and block-counting sections.

MAJOR SUBJECTS WITH SRA NON-VERBAL

Partial correlations of major subjects with SRA Non-Verbal when Cooperative Vocabulary, Cooperative Reading, and AGCT are held constant, Table XII, like the partial correlations of Tables IX and XI, are too small to be significant. Here again, as was shown in the relationships between major subjects and AGCT, SRA Non-Verbal is of more importance to mathematics than to English or Social studies. This greater significance of SRA Non-Verbal to mathematics than to the other major subjects is what might be expected

TABLE XII

PARTIAL CORRELATIONS FOR MAJOR SUBJECTS WITH
SRA NON-VERBAL WHEN COOPERATIVE VOCABULARY,
COOPERATIVE READING, AND AGCT
ARE HELD CONSTANT

Major Subject	Partial Correlation
English	.05
Mathematics	.10
Social Studies	.004

from the nature of the subject matter: it is principally non-verbal and necessitates recognition of relationships in working out problems, as was previously mentioned in discussing Table V.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This study was undertaken with the purpose of determining the relationship between vocabulary and success in three, grade-eight major subjects: English, mathematics, and social studies, to indicate the need, if evidenced, of emphasis upon more careful vocabulary training.

Four tests: Cooperative Vocabulary, Cooperative Reading, AGCT, and SRA Non-Verbal, were administered to 207 eighth grade pupils. Grades in the three major subjects for six quarters: four quarters of grade seven and two of grade eight, were converted into grade points. Product-moment correlations and partial correlations were calculated between each of the test scores and grade points for each subject.

By way of summary of the data it has been found that:

1. Varying degrees of relationship exist between grades in English and the several test scores. Reading ability appears to be an appreciable aid to successful work in English, whereas verbal mental ability, vocabulary skill, and non-verbal ability, as here measured, have but slight relationship.

2. In general, grades in mathematics and the several test scores show less relationship than do the grades for English and social Studies with test scores. Reading ability, as related to mathematics, is the most significant of the factors measured; but it has only slight relationship to success in that subject. Verbal mental ability, vocabulary skill, and non-verbal ability follow in decreasingly low correlation.

3. As with English and mathematics grades, reading ability has the most significant relationship to successful work in social studies. Vocabulary skill and verbal mental ability have a greater bearing upon achievement in social studies than they do upon the other major subjects. Non-verbal ability holds a place of but slight importance to this subject.

4. Vocabulary skill is a substantial factor in both reading ability and verbal mental ability. Vocabulary skill, from its very nature, is not significantly related to non-verbal ability.

In this study with these instruments the data indicate, then, that reading ability is more important to scholarship than is vocabulary skill, verbal mental ability, or non-verbal ability, and that vocabulary is of substantial importance to reading ability

and verbal ability

IMPLICATIONS

This study, showing as it does the importance of reading ability to successful work in major subjects, is an eloquent plea for instruction toward improved reading. Teachers of subjects requiring reading ability, as well as the students themselves, agree that scholarship is hampered by the low comprehension of slow, labored reading.

Since vocabulary skill is an important factor in reading ability, it may follow that reading ability would be improved through intensive training in vocabulary skill.

Because vocabulary correlates substantially with verbal mental ability, and in view of the important place that measures of mental ability hold in pupil placement and in prediction of success, intensive vocabulary training with due emphasis upon vitalized content and social motive might be worth considering as a means of improving such measures of mental ability.

LIMITATIONS

Several limitations exist in this study:

1. In attempting to evaluate the importance of

vocabulary to successful work in major subjects all possible factors contributing to such success were not considered. Among those not considered are: quality of teaching, general ability measured by an individual test, motivating interests, health, study time and methods, and adaptability.

2. The Cooperative Vocabulary test used in this study is a recognition vocabulary test only. Active word knowledge is not considered.

3. The reading test and the mental ability test include vocabulary tests which have an effect upon the resultant correlations with vocabulary.

4. The non-verbal ability test might be considered too short to be thoroughly reliable.

SUGGESTIONS FOR FURTHER STUDY

1. The data of this thesis should be studied for purposes of guidance to determine which pupils of this group are handicapped through low reading ability, low vocabulary skill, or under achievement, and to devise a method of giving them the special kind of help they need.

2. In the same light, for purposes of guidance, the pupils of low mental ability who are achieving well, the "over achievers" of this group, should be

sought out. The cause of the apparent success in school work should be determined: that is, whether some special skill is contributing to this success, such as vocabulary skill, which might be a clue to aid other anxious children of low mental ability, or whether such "success" is achieved at the expense of general well-being.

3. Since this study, which has made an evaluation of the pupils' present and incidental vocabulary skill as it related to school success, has not shown the apparent importance of vocabulary to that success, it would be of interest to make a similar evaluation after conducting an experimental study in which one group would receive intensive vocabulary training while the control group proceeded with the usual course of study.

4. In view of the observation of Johnson O'Connor,¹ quoted earlier in this thesis, it would be of interest to get a measure of the vocabulary skill of high school seniors and then conduct a follow-up study to find the relationship between vocabulary skill and the type of positions held. Such a study would serve as a guidance tool to indicate the pos-

1. See p. 1

sible value of vocabulary in predicting work success in certain jobs.

5. A study might be conducted to determine how many more words high ranking students know than low ranking students know as a basis for learning the needs of the two groups.

6. A follow-up of this study might be made to determine how well the data predict high school success.

7. A follow-up study might be made to determine what change ensues in vocabulary skill from grade to grade.

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APPENDIX A

SAMPLE SCATTERGRAM

SAMPLE PRODUCT-MOMENT CORRELATION

Chart I. Sample Scattergram:
Cooperative Vocabulary and AGCT

Vocabulary (x variable)

	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	
126-132						1								1
119-125					1	1	1		1					4
112-118					1	1	2	3	1					5
104-111					1	5	2	6	2				1	17
97-103				2	4	11	11	4	3	1				25
90-96			1	11	5	9	5	5	5					30
83-89			1	11	4	7	5	1	1					26
76-82		1	3	11	5	9	5	1	1					30
69-75	1	2	2	15	11	5	4							39
62-68		11	11	11	11	11	11							12
54-61	1	1	2	11	2	11	2							11
47-53				1	1	1								3
40-46	2	9	8	38	40	56	30	18	5				1	207

AGCT (y variable)

Vocabulary (x variable)

	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-	
	14	19	24	29	34	39	44	49	54	59	64	69	74	79	
121-132						1									1
119-125					1										4
112-118							1								5
106-111								1							17
97-103									1						25
90-96										1					30
83-89															26
76-82															30
69-75															39
62-68															12
54-61															11
47-53															3
40-46															4
Σx	2	9	8	38	40	56	30	18	5					207	
$\Sigma x'$	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7		
$\Sigma x'^2$	25	16	9	4	1	0	1	4	9	16	25	36	49		
$\Sigma y'$	-6	-3	-1	2	4	13	13	40	13						
$\Sigma y'^2$	36	9	1	4	16	169	169	1600	169						

AGCT (y variable)

Boston University
School of Education

$$\begin{aligned} \Sigma x' &= -98 \\ \Sigma y' &= 50 \\ \Sigma x'^2 &= 207 \\ \Sigma y'^2 &= 207 \\ \Sigma x'y' &= -223 \\ \Sigma x'y'^2 &= -473 \\ \Sigma y'^2 &= -241 \\ \Sigma x'y'^2 &= .058 \end{aligned}$$

$$r = \frac{\Sigma x'y' - \frac{\Sigma x' \Sigma y'}{N}}{\sqrt{\frac{\Sigma x'^2}{N} \frac{\Sigma y'^2}{N}}}$$

$$\begin{aligned} r &= \frac{485}{207} - \frac{(-.47 \times -24)}{207} = \frac{485}{207} - \frac{11.28}{207} = \frac{473.72}{207} = .2288 \\ r &= \frac{2.239}{3.610} = .620 \\ r &= \frac{1 - r^2}{\sqrt{N}} = \frac{1 - .384}{\sqrt{207}} = \frac{.616}{14.39} = .043 \end{aligned}$$

$$\begin{aligned} y &= \frac{1188}{207} - (-.058) x = \frac{1188}{207} + .058 x \\ &= \frac{5.80}{1} = 5.80 + .058 x \end{aligned}$$

APPENDIX B

GENERAL PURPOSE TABLE

GENERAL PURPOSE TABLE

Pupils' Names	Numerical Value of School Grades			Mental Ability Scores		Cooperative Reading Scores				Cooperative Vocabulary
	English	Mathematics	Social Studies	AGCT	SRA Non-verbal	Vocabulary	Speed	Level	Total	Scores
Adams, J.	78	78	81	111	108	45	52	52	50	46
Adrien, R.	76	71	66	75	97	26	27	27	27	29
Ahern, M.	71	68	75	80	68	44	35	40	40	24
Anderson, I.	81	80	80	110	102	52	50	79	60	50
Annis, C.	61	65	76	96	110	38	43	38	40	36
Arena, J.	81	81	80	105	93	44	45	57	49	41
Aulson, M.	86	86	83	119	121	51	56	57	55	45
Bailey, R.	68	76	76	81	91	38	37	42	39	36
Barber, L.	76	80	75	74	105	39	43	53	45	39
Barr, R.	70	81	83	92	105	43	52	85	61	41
Beaudet, P.	70	75	76	102	100	39	38	34	37	26
Beaupre, J.	70	70	70	106	98	42	47	63	51	43
Bickford, R.	71	78	73	66	92	25	34	31	29	27
Bissell, J.	70	56	73	67	71	33	24	24	26	29
Blaisdell, J.	78	78	83	61	96	31	32	37	33	34
Bowzer, Delores	76	71	78	74	78	32	27	27	28	26
Bowzer, Donald	70	76	73	60	87	34	39	45	39	35
Brazell, C.	80	71	76	64	80	32	31	35	32	28
Brothers, D.	65	56	70	71	96	14	27	29	21	16
Brown, D.	73	78	76	87	126	34	44	41	40	33
Buckley, B.	75	50	68	87	75	37	26	27	29	31
Buckley, P.	78	73	76	96	114	32	37	42	37	35
Bullard, H.	70	66	66	61	101	36	29	31	32	35
Buttrick, C.	66	50	71	80	91	43	47	65	52	39
Caldwell, J.	65	65	70	63	87	32	42	38	37	17
Carr, J.	66	65	70	99	107	34	32	30	32	38
Carvalho, H.	66	56	71	70	113	32	35	40	36	32
Cassey, M.	80	76	75	89	108	39	43	53	45	28
Cecil, J.	66	63	75	71	77	32	37	33	34	32
Chamberlain, R.	76	73	78	108	105	46	51	51	49	47
Clark, C.	73	78	70	55	84	39	43	53	45	19
Clinton, W.	66	71	75	82	93	33	30	34	32	35
Cochran, G.	66	65	71	75	102	45	42	50	46	43
Cole, D.	66	75	78	79	116	45	47	65	52	40
Colpitts, H.	76	70	71	79	91	45	39	45	43	35
Comeau, E.	66	63	73	109	124	37	60	61	53	37
Connolly, R.	90	81	88	105	121	51	46	61	53	50
Corrado, B.	80	73	78	67	88	22	30	34	36	36
Corton, J.	71	78	75	77	83	36	34	39	36	32
Crevatis, C.	78	56	76	98	95	39	45	59	48	39
Crocker, L.	66	65	66	84	96	33	31	35	33	28
Crowe, E.	71	65	65	73	96	14	32	37	27	20
Crowe, R.	63	65	50	40	105	25	34	31	29	19

GENERAL PURPOSE TABLE (Continued)

Pupils' Names	Numerical Value of School Grades			Mental Ability Scores		Cooperative Reading Scores				Cooperative Vocabulary
	English	Mathematics	Social Studies	AGCT	SRA Non-verbal	Vocabulary	Speed	Level	Total	Scores
Cumminsky, E.	70	70	80	57	103	41	32	37	37	39
D'Allessandro, N.	63	70	63	75	111	22	37	33	30	28
Daigle, L.	80	80	90	96	111	46	48	69	55	46
Daigle, P.	75	80	80	113	108	45	51	85	61	42
Daras, F.	73	73	71	93	96	34	39	45	40	25
Davies, R.	55	50	65	73	78	39	31	30	33	29
Day, B.	75	76	71	80	123	29	34	39	34	31
DeMontier, F.	70	68	70	54	61	30	31	35	32	41
Dimes, D.	68	63	75	93	95	44	34	39	39	37
Donahue, C.	70	66	65	68	105	27	22	21	21	26
Donovan, M.	70	71	70	71	110	22	38	44	35	30
Dorson, H.	70	68	70	88	108	35	34	31	33	35
Doucette, L.	58	81	80	111	82	46	49	49	48	45
Dresser, M.	88	81	88	95	105	68	47	63	60	48
Dube, L.	70	70	81	102	108	50	43	52	48	54
Dugas, R.	73	63	66	96	103	44	46	61	50	42
Dunning, G.	80	78	78	87	111	42	47	45	45	37
Durgin, R.	50	70	80	103	81	35	37	45	39	32
Fenton, M.	80	73	78	61	99	27	35	32	31	30
Finnegan, W.	71	80	76	74	81	44	38	44	42	39
Fitzpatrick, J.	65	61	50	90	111	30	30	28	29	32
Fletcher, C.	70	71	83	93	96	48	55	56	53	47
Flynn, Claire	80	80	80	93	99	55	53	54	54	48
Flynn, Clyde	63	70	68	82	93	27	30	34	30	29
Gallant, J.	66	61	63	73	95	34	40	36	37	27
Gard, H.	70	73	71	70	68	37	22	21	25	31
Gilchrist, W.	70	63	70	85	103	36	40	47	41	37
Goonyep, E.	70	76	78	121	123	54	36	48	46	51
Gowen, C.	68	73	80	69	99	32	39	45	39	30
Grant, G.	66	68	76	72	96	27	27	29	27	19
Gratton, E.	80	80	83	75	116	39	50	51	47	35
Green, H.	65	65	70	66	93	39	31	35	35	32
Gregory, C.	68	70	68	102	103	30	31	35	32	38
Guptill, W.	63	70	71	98	93	41	37	42	40	43
Hart, R.	80	86	88	103	123	48	51	85	62	49
Hennessey, P.	83	71	81	88	71	33	19	18	21	36
Henry, C.	73	71	80	99	117	46	48	67	54	49
Herman, B.	71	63	73	132	77	38	43	52	44	37
Hetherington, J.	88	78	90	98	111	46	46	61	51	46
Hicks, C.	66	71	75	98	114	44	49	75	56	35
Hodsdon, E.	73	75	71	79	99	38	32	30	33	21
Hofmann, L.	83	80	86	79	98	46	49	49	48	37
Horgan, D.	71	78	80	89	125	41	42	50	44	31

GENERAL PURPOSE TABLE (Continued)

Pupils' Names	Numerical Value of School Grades			Mental Ability Scores		Cooperative Reading Scores				Cooperative Vocabulary
	English	Mathe- matics	Social Studies	AGCT	SRA Non-verbal	Vocabu- lary	Speed	Level	Total	Scores
Horgan, G.	71	63	70	85	92	43	43	53	46	44
Howard, L.	50	66	73	85	108	30	26	27	27	31
Hoyt, L.	66	66	70	57	78	38	32	37	36	29
Hutton, Barbara	76	85	78	82	102	49	42	50	47	47
Hutton, Beverly	76	66	66	85	95	39	30	34	34	40
Jemery, E.	66	78	65	110	99	39	30	28	32	40
Kachocki, R.	86	86	90	102	114	25	37	42	35	32
Karlson, B.	81	88	85	96	126	29	32	30	30	19
Kassiotis, P.	73	61	73	107	92	36	19	18	23	25
Kelley, D.	55	78	76	77	93	34	37	42	37	17
Kennedy, D.	71	75	80	90	103	39	37	42	39	38
Kennedy, E.	56	55	60	125	102	34	19	18	22	42
Kentenjian, R.	71	73	75	71	96	35	27	29	30	28
King, C.	75	73	70	92	93	43	32	37	37	43
King, J.	81	81	81	109	98	18	34	39	30	31
King, S.	70	68	81	77	111	42	46	44	44	39
Kingdon, B.	83	81	85	110	102	29	29	31	29	28
Kitchell, J.	73	80	80	116	113	48	46	61	52	46
Kline, N.	78	76	76	99	102	27	19	18	19	25
Knowlton, S.	71	66	70	58	96	27	39	35	34	27
LaClair, R.	71	80	78	64	74	42	35	40	38	30
LaFleur, N.	73	63	66	72	85	37	46	61	48	31
LaRivee, J.	71	73	75	81	113	36	37	42	38	38
Leavitt, R.	81	81	86	115	89	33	41	48	41	33
Lee, J.	70	80	73	106	121	33	46	44	41	28
Legro, R.	55	68	55	75	87	43	38	44	42	33
Lesperance, M.	71	78	55	82	104	41	39	45	42	38
Limauro, L.	78	76	68	49	108	33	19	18	21	40
Limoges, J.	71	70	76	79	116	41	38	44	41	36
Locke, Dean	56	68	63	54	64	44	30	29	34	28
MacDonald, P.	70	68	78	106	87	43	43	53	46	38
MacInnis, R.	78	83	81	102	116	34	37	33	35	28
MacNair, R.	73	63	76	89	100	48	55	56	53	35
MacPherson, N.	86	83	81	99	108	35	45	43	41	35
Mann, J.	83	88	81	95	110	39	37	33	36	38
Mannell, J.	63	70	68	76	91	39	41	37	39	42
Martin, J.	60	70	75	51	100	36	39	50	42	38
Mazza, C.	78	78	76	84	102	14	34	31	25	17
McDonald, R.	65	63	68	106	99	31	34	31	32	14
McGlone, V.	83	81	83	89	64	35	29	27	30	14
McGrath, K.	86	86	86	96	111	37	31	29	32	22
McLaughlin, P.	70	66	78	85	92	27	19	18	19	25
McMahon, D.	80	76	78	64	111	33	39	35	36	30

GENERAL PURPOSE TABLE (Continued)

Pupils' Names	Numerical Value of School Grades			Mental Ability Scores		Cooperative Reading Scores				Cooperative Vocabulary
	English	Mathematics	Social Studies	AGCT	SRA Non-verbal	Vocabulary	Speed	Level	Total	Scores
McManus, C	83	80	80	86	95	39	48	47	45	39
Merrill, F.	71	68	73	98	105	49	48	69	56	53
Messina, D	71	63	71	103	99	14	35	32	26	20
Migliore, J.	88	83	90	110	95	39	35	40	38	40
Miller, W.	66	55	66	79	100	30	37	42	36	35
Mitchell, N.	68	75	63	72	77	29	37	42	36	33
Moore, V.	71	76	76	73	102	42	47	45	45	44
Morine, D.	73	63	76	66	115	40	47	63	50	39
Murphy, R.	73	81	71	79	90	70	60	62	65	71
Nolan, W.	70	50	70	76	81	32	37	42	37	39
Norris, T.	73	76	73	85	105	39	46	44	43	36
O'Blenes, R.	68	56	66	60	79	43	42	50	45	31
O'Donnell, J.	70	71	76	83	91	35	34	39	36	43
Oldenquist, M.	78	70	78	90	116	29	22	23	23	26
Osgood, R.	55	70	66	75	93	38	43	52	44	34
Pasquale, R.	75	65	80	98	94	40	48	69	52	29
Peach, R.	66	78	75	75	70	47	46	61	51	39
Perkins, F.	66	68	76	80	102	46	63	66	59	48
Pickering, J.	66	70	73	69	93	34	44	55	44	44
Pickering, P.	65	66	65	40	69	37	31	29	32	35
Ralph, S.	75	65	75	74	102	25	37	42	35	25
Raney, M.	80	81	81	97	99	33	45	42	40	25
Rawding, J.	70	73	76	73	108	39	43	53	45	35
Raymond, J.	71	50	73	73	90	51	49	48	49	47
Regan, T.	66	75	78	88	105	37	31	29	32	37
Reid, B.	83	81	88	97	111	33	34	31	33	27
Reynolds, E.	66	63	68	84	84	36	61	63	54	35
Richard, D.	66	75	75	77	96	34	31	35	33	33
Richard, R.	81	81	78	96	108	39	44	41	41	28
Richardson, A.	70	71	75	96	114	14	31	29	23	21
Rigol, J.	63	76	75	77	90	35	34	39	36	35
Robbins, F.	78	76	80	125	133	39	47	65	50	33
Russo, P.	78	75	71	86	105	34	31	35	33	32
Rutstein, H.	78	78	80	102	117	40	45	48	44	38
Saba, J.	73	55	78	95	97	45	47	65	52	40
Schultz, C	58	66	63	81	84	22	29	31	26	21
Scott, R.	65	56	66	45	97	27	14	18	17	25
Segal, P.	65	50	70	60	69	30	24	24	25	33
Shachok, Albert	70	66	70	57	78	33	43	52	43	40
Shachok, Alfred	70	61	71	72	78	33	35	40	36	38
Shaw, N.	56	71	56	51	97	35	46	61	47	42
Sine, J.	65	68	66	73	108	44	43	59	49	36
Smith, S.	60	61	75	92	110	37	43	40	40	36

GENERAL PURPOSE TABLE (Continued)

Pupils' Names	Numerical Value of School Grades			Mental Ability Scores		Cooperative Reading Scores				Cooperative Vocabulary
	English	Mathematics	Social Studies	AGCT	SRA Non-verbal	Vocabulary	Speed	Level	Total	Scores
Snaddon, P.	71	66	78	105	134	40	43	53	45	47
Snell, D.	73	80	75	93	110	39	44	55	46	33
Spanks, N.	56	71	81	88	111	31	39	35	35	31
Spearing, C.	76	71	78	72	83	35	44	41	40	37
Stanley, D.	66	70	56	76	107	33	31	29	30	31
Staples, A.	73	73	63	96	83	32	22	21	23	25
Staples, E.	75	78	80	96	99	38	35	40	38	34
Starrett, B.	86	86	90	99	129	41	48	69	53	35
Stilianos, E.	80	80	81	92	99	36	37	42	38	35
Sullivan, M.	73	70	78	82	130	44	40	47	44	40
Tagliamonte, E.	76	81	78	92	94	57	45	42	48	22
Tammara, R.	73	73	75	74	113	35	27	29	30	33
Tibbetts, R.	80	80	76	98	111	39	30	34	34	38
Tucker, P.	75	76	80	66	87	36	34	39	36	28
Tucker, R.	71	78	81	97	113	40	46	61	49	40
Uhl, Breta	66	68	78	72	93	39	45	59	48	27
Ulfo, R.	78	80	80	119	126	47	51	52	50	44
Varnum, E.	80	68	86	106	75	46	34	39	40	49
Vose, Y.	81	81	83	113	129	47	52	52	50	43
Walfield, B.	80	76	78	92	126	42	32	37	37	39
Walsh, W.	70	85	78	96	69	35	37	42	38	46
Warrington, J.	83	81	80	82	99	44	49	49	47	43
Warrington, Jean	75	78	70	74	96	45	38	44	42	26
Watson, W.	71	70	71	82	105	18	32	30	25	31
Whalen, P.	76	65	80	87	102	39	40	36	38	42
Whincup, K.	50	73	50	85	95	34	30	34	32	32
Wiggin, E.	70	61	66	73	89	37	34	31	34	35
Wyman, R.	66	68	68	73	98	33	46	44	41	28
Yarowski, C.	61	50	70	75	130	46	19	20	27	42
Yoke, D.	76	70	73	85	113	30	43	39	37	33
Zalms, D.	66	68	76	95	99	33	30	34	32	32
Zappacosta, R.	71	50	66	44	94	32	37	37	35	26
Zucaro, P.	65	70	70	72	79	41	41	48	43	18
Zucaro, R.	65	66	65	40	69	42	35	40	38	30
Zurek, C.	75	70	70	76	102	27	14	18	17	25

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